

REMARKS

In the March 12, 2009 Office Action, claims 3-5 and 8-14 stand rejected in view of prior art. No other objections or rejections were made in the Office Action.

Status of Claims and Amendments

In response to the March 12, 2009 Office Action, Applicants have amended claims 3-5 and 8-10 as indicated above. Thus, claims 3-5 and 8-14 are pending, with claims 3-5 and 8-10 being the only independent claims. Reexamination and reconsideration of the pending claims are respectfully requested in view of above amendments and the following comments.

Rejections - 35 U.S.C. § 103

In paragraphs 5-17 of the Office Action, claims 3-5 and 8-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over International Patent Publication No. 01/21959 (Horiuchi et al.) in view of U.S. Patent No. 3,593,103 (Chandler et al.) as extrinsically evidenced by Applicant's disclosure of prior art and further in view of U.S. Patent No. 3,440,508 (Fujita). In response, Applicants have amended independent claims 3-5 and 8-10 to more clearly define the present invention over the prior art of record.

Claims 3, 8, 11 and 13

Independent claim 3 now requires: driving a motor based upon a horse power command value using a discharge pressure-discharge flow characteristic; carrying out feedback control of a discharge pressure; driving a pump using the motor; defining a predetermined value of a set horse power as a characteristic value for a predetermined value of a power voltage, the discharge pressure-discharge flow characteristic being represented by a curved line based on the set horse power on pressure axis and flow axis; and changing the curved line with the set horse power that is corresponding to a detected value of the power voltage to change the horse power command value.

Similarly, independent claim 8 now requires: a motor configured to be driven based upon a horse power command value using discharge pressure-discharge flow characteristic to

feedback control a discharge pressure; a pump operatively coupled to the motor; and a characteristic changing section configured to define a predetermined set horse power as a characteristic value for a predetermined power voltage, the discharge pressure-discharge flow characteristic being represented by a curved line based on the set horse power on pressure axis and flow axis, and the characteristic changing section being further configured to change the curved line with the set horse power that is corresponding to a detected value of the power voltage to change the horse power command value.

SUPPORT FOR AMENDMENTS – Claims 3 and 8

With regard to "driving a motor based upon a horse power command value using a discharge pressure - discharge flow characteristic", "the horse power command generation section 5 generates a horse power command based upon the adequate P-Q characteristic" (Page 11, Lines 12-13 of the instant application) supports this amendment.

With regard to "defining a predetermined value of a pressure, flowing amount, and set horse power as a characteristic values value for a predetermined value of a power voltage", it is understood from the description of Page 1, Lines 25-29 that discharge pressure - discharge flow characteristic is generated by a set pressure, a set flowing amount, and a set horse power. It is readily apparent to a person skilled in the art that a set pressure and a set flowing amount here does not depend on a power voltage, and are determined by external factors of a pump (pump performance). A maximum flowing amount and a maximum pressure for a pump are determined independently of a power voltage of a motor. Thus, based on the above, this amendment is fully supported by the original disclosure.

With regard to "the discharge pressure - discharge flow characteristic being represented by a curved line based on the set horse power on pressure axis and flow axis", a set horse power is shown as an inverse proportion curved line on coordinate of pressure-flowing amount axis in Page 1, Lines 25-29 and fig 2 of the instant application. Thus, this amendment is fully supported by the original disclosure.

With regard to "changing the curved line with the set horse power -that is corresponding to a detected value of the power voltage to change the horse power command value in correspondence with a detection value of the power voltage", the specification describes how to generate the modified horse power by calculating a ratio between a

predetermined power voltage and a detected DC voltage and the ratio multiplied by the set horse power in Page 10, Lines 20-27. Therefore, support for these amendments is readily apparent to a person skilled in the art from this description of the specification.

ARGUMENTS – Claims 3, 8, 11 and 13

The Horiuchi et al. publication and/or the Chandler et al. patent fail to disclose or suggest (1) "a command value" as "a horse power command value", (2) "defining a predetermined pressure, flowing amount, and horse power as characteristic values for a predetermined power voltage" as "defining a predetermined value of a set horse power as a characteristic value for a predetermined value of a power voltage, and additionally (3) "the discharge pressure - discharge flow characteristic being represented by a curved line based on the set horse power on pressure axis and flow axis", and "changing the curved line with the set horse power that is corresponding to a detected value of the power voltage to change the horse power command value", as now set forth in independent claims 3 and 8.

The Fujita patent only shows torque-rotation characteristic when the supply voltage is increased to a motor, but does not show torque-rotation characteristic to the DC voltage. Further, in common inverter control, the inverter controls torque and rotation in accordance with the command value despite the increase of the DC voltage even if the DC voltage increases. Therefore, torque-rotation characteristic does not change when the power voltage increases in common inverter control. The supply voltage in the Fujita patent means the voltage supplied from the inverter to the motor, and the DC voltage in the present application means the DC voltage from the input side of the inverter, thus, these are different. Incidentally, Reddy (cited in the prior Office Action) suffers from the same deficiencies as the Fujita patent.

Since it is specified that "the discharge pressure- discharge flow characteristic is changed by changing a set horse power in accordance with the power voltage and the horse power command value is change by the change of the discharge pressure-discharge flow characteristic", the relation between a matter of defining a predetermined value of a set horse power as a characteristic value for a predetermined value of a power voltage and another matter is now clearly specified, and not disclosed or suggested in the prior art. Thus, a hypothetical device created by combining the references as suggested in the Office Action

would not include all of the features of independent claims 5 and 10. Accordingly, withdrawal of the rejection of independent claims 3 and 8 are respectfully requested.

Moreover, Applicants believe that dependent claims 11 and 13 are also allowable over the prior art of record in that they depend from independent claims 3 or 8, and therefore are allowable for the reasons stated above. Also, dependent claims 11 and 13 are further allowable because they include additional limitations, which in combination with the features of independent claims 3 and 8, are not disclosed or suggested in the prior art. Accordingly, withdrawal of this rejection of dependent claims 11 and 13 is also respectfully requested.

Claims 4, 9, 12 and 14

Independent claim 4 now requires: driving a motor based upon a command value, carrying out feedback control of a discharge pressure, driving a pump using the motor based on whether or not a detected DC voltage of an inverter for supplying a driving voltage to the motor is an ideal DC voltage value of an alternate current power voltage, changing the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage, and maintaining the command value last changed during a period in which the detected DC voltage is the ideal DC voltage value upon judging that the detected DC voltage is not the ideal DC voltage value of the alternate current power voltage.

Similarly, independent claim 9 now requires: a motor configured to be driven based upon a command value to feedback control a discharge pressure, a pump operatively coupled to the motor, and judgment section configured to judge whether or not a detected DC voltage of an inverter for supplying a driving voltage to a the motor is an ideal DC voltage value of an alternate current power voltage, configured to change the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage, and configured to maintain the command value last changed during a period in which the detected DC voltage is the ideal DC voltage value upon judging that the detected DC voltage is not the ideal DC voltage value of the alternate current power voltage.

SUPPORT FOR AMENDMENTS – Claims 4 and 9

The description in the instant application of "The correction of P-Q characteristic is carried out only in a case that the DC voltage is supposed to become the ideal DC voltage value of the AC power voltage (AC voltage x 2112). In transient state, the modified horse power is continuously used, the modified horse power being held by the modified horse power holding section 225 prior to becoming transient state." (Page 13, Lines 7-11) provides support for these amendments.

ARGUMENTS – Claims 4, 9, 12 and 14

The Chandler patent shows that command value VE is to be changed in accordance with a dip in the input power voltage and the command value VE is maintained for the duration of the dip in the input power voltage afterwards, thus the command value before the dip in the input power voltage is not maintained for the duration of the dip in input power voltage (Col. 8, second paragraph). In other words, if the detected DC voltage is in dip and different from the ideal DC voltage, a value of detected DC voltage or command value before the dip of the detected DC voltage is maintained. In Chandler, a command value VE before the dip in the DC voltage should be 0.0V, the command value VE is maintained in 0.5V. In contrast, claims 4 and 9 now describe "a value of said detected DC voltage used when said command value was last changed during period in which the detected DC voltage is the ideal DC voltage value" is maintained. Thus, contrary to the assertions of the Office Action the Chandler patent cannot disclose or suggest this arrangement, as now required in these claims. Claims 5 and 10 describes "the command value last changed during period in which the detected DC voltage is the ideal DC voltage value" is maintained. Thus, contrary to the assertions of the Office Action the Chandler patent cannot disclose or suggest this arrangement, as now required in these claims. Accordingly, a hypothetical device created by combining the references as suggested in the Office Action would not include all of the features of independent claims 4 and 9.

Moreover, Applicants believe that dependent claims 12 and 14 are also allowable over the prior art of record in that they depend from independent claims 4 or 9, and therefore are allowable for the reasons stated above. Also, dependent claims 12 and 14 are further allowable because they include additional limitations, which in combination with the features

of independent claims 4 and 9, are not disclosed or suggested in the prior art. Accordingly, withdrawal of this rejection of dependent claims 12 and 14 is also respectfully requested.

Claims 5 and 10

Independent claim 5 now requires: driving a motor based upon a command value, carrying out feedback control of a discharge pressure, driving a pump using the motor based on whether or not a detected DC voltage of an inverter for supplying a driving voltage to the motor is an ideal DC voltage value of an alternate current power voltage, changing the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage, and maintaining a value of said detected DC voltage used when said command value was last changed during a period in which the detected DC voltage is the ideal DC voltage value upon judging that the detected DC voltage is not the ideal DC voltage value of the alternate current power voltage.

Similarly, independent claim 10 now requires: a motor configured to be driven based upon a command value to feedback control a discharge pressure, a pump operatively coupled to the motor, and judgment section configured to judge whether or not a detected DC voltage of an inverter for supplying a driving voltage to the motor is an ideal DC voltage value of an alternate current power voltage, configured to change the command value for the detected DC voltage upon judging that the detected DC voltage is the ideal DC voltage value of the alternate current power voltage and configured to maintain a value of said detected DC voltage used when said command value was last changed during a period in which the detected DC voltage is the ideal DC voltage value upon judging that the detected DC voltage is not the ideal DC voltage value of the alternate current power voltage.

SUPPORT FOR AMENDMENTS – Claims 5 and 10

The description in the instant application of "The correction of P-Q characteristic is carried out only in a case that the DC voltage is supposed to become the ideal DC voltage value of the AC power voltage (AC voltage x 2112). In transient state, the modified horse power is continuously used, the modified horse power being held by the modified horse power holding section 225 prior to becoming transient state." (Page 13, Lines 7-11) provides support for these amendments.

ARGUMENTS – Claims 5 and 10

The Chandler patent shows that command value VE is to be changed in accordance with a dip in the input power voltage and the command value VE is maintained for the duration of the dip in the input power voltage afterwards, thus the command value before the dip in the input power voltage is not maintained for the duration of the dip in input power voltage (Col. 8, second paragraph). In other words, if the detected DC voltage is in dip and different from the ideal DC voltage, a value of detected DC voltage or command value before the dip of the detected DC voltage is maintained, and thus, the command value VE before the dip in the DC voltage should be 0.0V, the command value VE is maintained in 0.5V. In contrast, claims 5 and 10 now describe "the command value last changed during period in which the detected DC voltage is the ideal DC voltage value" is maintained. Thus, contrary to the assertions of the Office Action the Chandler patent cannot disclose or suggest this arrangement, as now required in these claims. Accordingly, a hypothetical device created by combining the references as suggested in the Office Action would not include all of the features of independent claims 5 and 10.

Under U.S. patent law, the mere fact that the prior art can be modified does *not* make the modification obvious, unless an *apparent reason* exists based on evidence in the record or scientific reasoning for one of ordinary skill in the art to make the modification. See, KSR Int'l Co. v. Teleflex Inc., 127 S.Ct. 1727, 1741 (2007). The KSR Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." Id. at 1741. The current record lacks any apparent reason, suggestion or expectation of success for combining the patents, and then modifying the hypothetical device created by such a combination to result in Applicants' unique arrangements of claims 3-5 and 8-14, as explained above.

Appl. No. 10/534,690
Amendment dated June 10, 2009
Reply to Office Action of March 12, 2009

Prior Art Citation

In the Office Action, additional prior art references were made of record. Applicants believe that these references do not render the claimed invention obvious.

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In view of the foregoing amendment and comments, Applicants respectfully assert that claims 3-8 and 10-14 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,

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